

Social Media Usage for Collaborative Learning: Adoption of Behavior Theory and Technology Acceptance Model

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Abstract

The channel through which information is transmitted between societies and learners has long been viewed as social media. In this pandemic, colleges and universities have used social media to enhance collaborative learning and social engagement. Objectives: The main purpose of this study is to investigate the level of engagement of college students in Pampanga in using social media as a collaborative tool. TAM and TPB factors in the context of utilizing social media were used to design the survey questionnaire focusing on students' engagement. Seven research experts confirmed the questionnaire's validity. The researchers analyzed a total of 380 responses. The Smart PLS 3 was used to analyze the data obtained. Upon analysis, the study found a direct and indirect significant relationship between these variables on collaborative learning through social media, which might improve students' academic performance.

Keywords: collaborative learning, social media, behavior theory, technology acceptance model

Introduction

In the past, communication was stopped by barriers like distance and nationality. However, right now, these barriers cannot stop human from acquiring new information and knowledge because of the various social media platform like Facebook, Twitter, and Instagram, wherein the sharing of thoughts are free. Humans are social animals. They always like to stay in groups to talk about certain topics and intend to follow what this group does (Karadkar, 2015).

Social media is an adequate social platform for the learning process, but it requires imperative exertion to enhance the student's perspective on the usefulness of social media (Lubua et al., 2017). It only means that collaboration is still possible even though students are far away from each other. The learning process continues even though the student is at home. This paper will introduce the perceived usefulness of social media for collaborative learning. In the present, where innovation occurs, social platforms are utilized by everybody in this world to

communicate. It provides fast messaging and updated information. Furthermore, this study aims to know the level of engagement of college students in Pampanga in using social media as a collaborative tool in order to improve their collaborative learning and academic performance.

Method

A quantitative research method was chosen for this study to measure the level of engagement of the college students in Pampanga in using social media as a collaborative tool to improve their collaborative learning and academic performance using the behavior theory and technology acceptance model. Quantitative methods were associated with gathering and evaluating structured data that was represented numerically. Quantitative studies were specified as specifying a problem or research concern and identifying the methods through which one or more quantitative variables influence other variables (Taheri et al., 2015). McCusker and Gunaydin (2015) stated that quantitative data is

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somewhat more efficient and could be used to evaluate the hypothesis, but it may exclude contextual information. This method aims to identify characteristics, quantify them, and develop statistical methods to describe what is being observed. This study's hypotheses are as follows:

- H1.** Perceived usefulness may influence the use of social media for collaborative learning among the college students of Pampanga.
- H2.** There is a positive correlation between perceived usefulness and the attitude towards social media for collaborative learning.
- H3.** There is a positive link between perceived ease of use and attitude towards using social media for collaborative learning.
- H4.** Perceived ease of use may influence social norms towards using social media for collaborative learning.
- H5.** Social norms may influence attitude towards using social media for collaborative learning.
- H6.** There is a positive link between attitude and perceived behavioral control towards using social media for collaborative learning.
- H7.** The usage of social media for collaborative learning may be influenced by perceived behavioral control.
- H8.** Social norms may influence perceived behavioral control towards using social media for collaborative learning.

Research Instrument

For this study, a modified Google Forms questionnaire was used to collect relevant data from college students in Pampanga. The study

considered an online survey via Google form as the research instrument for easier and faster data collection. The items were organized and precision checked by City College of Angeles's Dean of Institute of Education, Arts and Sciences (IEAS), Academic Coordinator of the Bachelor of Technical Vocational and Teacher Education (BTVTED) Program, and Vice President for Research. The Faculty of the Department of Architecture Faculty of Environmental Science from Imo State University, Owerri, Associate Professor of the Department of Marketing and Advertising College of Business from De La Salle University, Assistant Professor of the Faculty of Information and Communication Studies from the University of the Philippines Open University, Guest Faculty of the School Management and Commerce from Babasaheb Bhimrao Ambedkar Central University, Assistant Professor III of the IEAS of the City College of Angeles, and the Research Coordinator of Burauen Community College also verified the accuracy of the previously mentioned instrument.

The researchers modified survey covers five topics: related questions to Perceived Usefulness, related questions to Perceived Ease of Use, related questions to Attitude, related questions to Social Norms, related questions to Perceived Behavioral Control, and related questions to social media for Collaborative Learning. This current study aims to measure the level of engagement of college students in Pampanga in using social media and determine the student's understanding of using social media platforms as their collaborative tool in e-learning.

Pilot study on reliability of the questionnaire

A statistical pilot study was conducted to support the experts' validation after completing the validation and corrections. Pilot testing determines whether something can be accomplished, whether it should be done, and, if so, how. On the other hand, pilot research has a distinct design feature: it is carried out on a

smaller scale than the main or full-size investigation. To put it another way, the pilot process is vital to the main study's quality and efficiency (In, 2017). Prior to this study, a pilot study was conducted to determine the degree of involvement among college students in Pampanga.

A customized Google Forms questionnaire was utilized to acquire pertinent student data. For the pilot study, the researchers carried out the study using convenience sampling. Students from the City College of Angeles IEAS department enrolled in the first semester of the Academic Year 2021-2022 took part in the pilot research. Students from the IEAS department who participated were handed overview surveys. A total of 33 students from the previously mentioned department participated in the pilot project.

Sampling Technique

The researchers employed a convenience sampling technique in selecting the participants for the study. Convenience sampling is a type of sampling that is not based on probability. Non-probability sampling methods are less objective than probability approaches. It is a sort of sampling in which the researcher selects, refers to, or self-selects participants rather than having each individual of a target population engage in a survey (Stratton, 2021).

Participants

This study's participants were college students from the province of Pampanga. They were chosen as participants because they are the most appropriate to the study's objectives. Participants were modified from BTVTED students coming from the City College of Angeles and Mabalacat City College to college students coming from the different schools in Pampanga.

Sampling Size

The survey should be at least 377 participants. It is more likely to get a correct answer from a large

sample with a small percentage of the population responding to your survey than from a small sample with only a small percentage of the population responding to your survey if you create a sample of this many people and get responses from everyone (Raosoft, 2020).

Scaling Technique

A 5-point Likert scale was utilized in this study that determines the level of engagement of the college students in using social media for collaborative learning. The following is the scale range: 1 as Strongly Disagree, 2 as Disagree, 3 as Neutral, 4 as Agree, and 5 as Strongly Agree. The scale is then used to accurately measure perceived usefulness, perceived ease of use, attitude, social norms, perceived behavioral control, and social media for collaborative learning.

Likert scale is a psychometric response scale that is most commonly used in questionnaires to determine a participant's preferences or level of agreement with a statement or collection of statements. Likert scales are a non-comparative scaling technique that is one-dimensional (measures only a single trait). Respondents are asked to use an ordinal scale to indicate their level of agreement with a specific statement (Aasa, 2016).

Adopted Analytical Tools

In analyzing the gathered data of this study, the researchers used SmartPLS version 3 and Microsoft excel as the statistical tool. Microsoft Excel is the first tool used to sort and encode data so that it may be readily translated into a format that SmartPLS can understand. SmartPLS is a user-friendly software that can be downloaded and used to calculate, validate, and test models. For studying such correlations, partial least squares structural equation modeling (PLS-SEM) has become a popular tool. The method's popularity was aided by the release of SmartPLS, a full software application with an intuitive

graphical user interface (Sarstedt & Cheah, 2019).

Measurement of Construct Reliability & Validity

In research, measurement instruments play a critical role. Studies on the measurement properties of these instruments provide evidence of how they were evaluated, which aids the researcher in selecting the optimal tool. The main measurement qualities of such instruments are considered their reliability and validity (Souza et al., 2017). Cronbach's alpha is a commonly used reliability metric for calculating the degree of random measurement error in a multi-item measurement scale's sum score or average (Hayes & Coutts, 2020).

PLS Algorithm Report

The study reported that Cronbach's alpha is between 0 and 1, with greater values showing that the items measure the same dimension. Suppose Cronbach's alpha value is low (around 0). In that case, it means that some or all of the items are measuring different dimensions and in green color in all variables: attitude, perceived usefulness, perceived ease of use, perceived behavioral control, social media for collaborative learning, and social norms, illustrates valid and significant as shown in Figure 1 (Bujang et al., 2018).

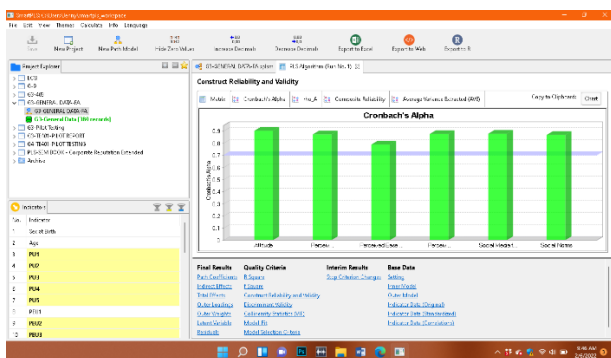


Figure 1. Values of Cronbach's Alpha

The Cronbach's alpha value and composite reliability of each construct can also be used to

determine construct reliability. Cronbach's alpha, rho A, and Composite Reliability should all be above 0.7. c). However, Composite Reliability was unaffected since Algorithms Henseler's (RhoA), the most important requirement for PLS, was met (Dijkstra & Henseler, 2015). The green color in all variables: attitude, perceived usefulness, perceived ease of use, perceived behavioral control, social media for collaborative learning, and social norms, displays all valid, as illustrated in Figure 2.

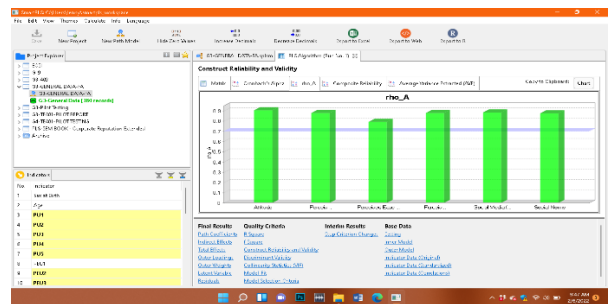


Figure 2. Rho A Values

The study's reliability, as stated by Hair et al. (2017), composite reliability is a less biased indicator of reliability. Composite Reliability values of greater than 0.7 are acceptable and in green color (Alarcón & Sánchez, 2015) in all variables: attitude, perceived behavioral control, perceived ease of use, perceived usefulness, social media for collaborative learning, and social norms, shows that all reliable and valid, as shown in Figure 3.

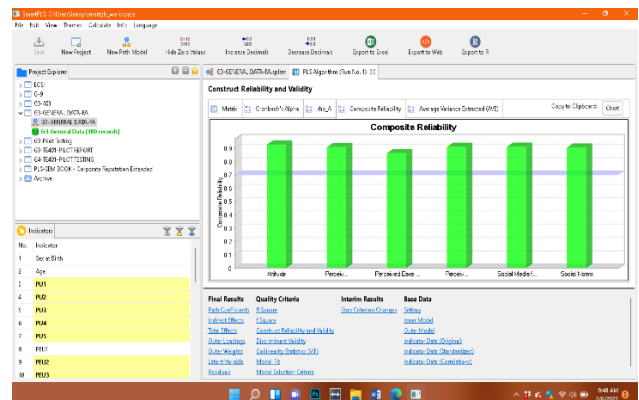


Figure 3. Composite Reliability Values

The validity of this study, as determined by the instructed Average Variance Extracted (AVE) (Rigdon et al., 2017), values above 0.7 are considered excellent. In contrast, a level of 0.5 is acceptable and in green color (Alarcón & Sánchez, 2015) in all variables: attitude, perceived behavioral control, perceived ease of use, perceived usefulness, social media for collaborative learning, and social norms, illustrates that all significant and valid as represented in Figure 4.

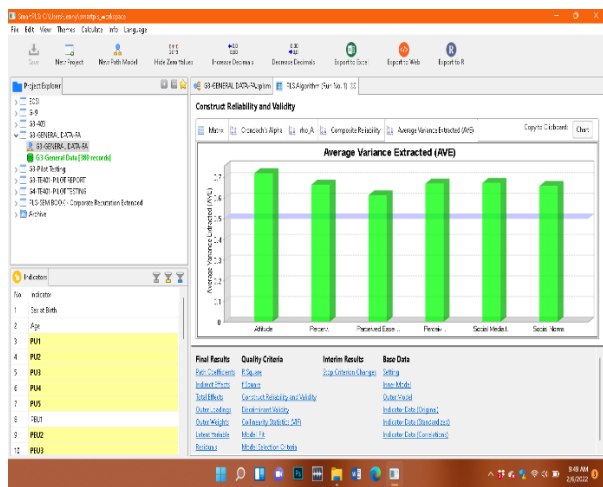


Figure 4. Average Variance Extracted (AVE) Values

Discriminant Validity

The discriminant validity using HTMT ratio, as shown in Table 3, has the highest value of 0.849 from Perceived Ease of use and attitude, while Perceived Usefulness and Perceived Behavioral Control has the lowest value of 0.622. Nevertheless, all items are supported by a 0.85 threshold, making them all relevant and achieved. (Roman et. al., 2020; Calma & Oluyinka, 2020; Pangilinan et al., 2020).

Table 1. Heterotrait-Monotrait Ratio Report

| | A | PBC | PEU | PU | SMCL | SN |
|-----|------|------|------|----|------|----|
| A | | | | | | |
| PBC | .696 | | | | | |
| PEU | .849 | .750 | | | | |
| PU | .846 | .622 | .797 | | | |

| | | | | | |
|------|------|------|------|------|------|
| SMCL | .779 | .786 | .794 | .730 | |
| SN | .731 | .760 | .680 | .629 | .765 |

Attitude (A); Perceived Behavioral Control (PBC); Perceived Ease of Use (PEU); Perceived Usefulness (PU); Social Media for Collaborative Learning (SMCL); and Social Norms (SN)

Results and Discussion

Demographic Details

The demographic report of the participants shows that 38.4% of the participants are male, and 61.6% are female. It displays that the majority of the respondents came from the school 1 with a total of 57.9%, followed by School 5 with 11.3%, then School 6 with 7.9%, while School 4 with 6.3%, then School 3 with 4.2%, followed by School 7 with 3.7%, then School 10 with 2.4%, School 14 with 1.8%, School 8 with 1.3%, then School 16 with 0.8, while School 9, School 12 and School 13 with 0.5%, and School 2, School 11, and School 15 with 0.3%. It also shows that 71.3% of the respondents are 21-23 years old, followed by 18-20 years old with 25.3%, then 24-26 years old with 2.6%, and 27-30 years old with 0.8%.

Bootstrap Report: Path Coefficients

The p-values, standard dev., and t-stats comprise the coefficients’ path drawn. A 0.05 level of significance is adopted. Table 2 shows the Path Coefficient values.

Table 2. Path Coefficients

| | Original Sample (O) | Sample Mean (M) | Std. Dev. | t Statistics | p values |
|----------|---------------------|-----------------|-----------|--------------|----------|
| PU→SMCL | .376 | .380 | .053 | 7.105 | <.001 |
| PU→A | .408 | .413 | .049 | 8.354 | <.001 |
| PEU→A | .305 | .303 | .060 | 5.104 | <.001 |
| SN→PEU | .564 | .568 | .042 | 13.490 | <.001 |
| SN→A | .254 | .252 | .049 | 5.167 | <.001 |
| A→PBC | .327 | .321 | .063 | 5.157 | <.001 |
| PBC→SMCL | .487 | .485 | .059 | 8.280 | <.001 |
| SN→PBC | .453 | .460 | .059 | 8.280 | <.001 |

Table 2 shows that perceived usefulness→ social media for collaborative learning with a p-value of 0.000, supports Hypothesis 1: Perceived usefulness may influence the use of social media

for collaborative learning, where $p < 0.05$. This indicates that the perceived usefulness of social media has a relevant positive impact on the collaborative learning of college students. With a significant result, thus, this perceived usefulness increases the social media usage of the college students for collaborative learning. The usage of social media for collaborative learning effectively improves learners' skills. It was found that collaborative learning has a significant impact on learners' performance in collaborative learning contexts. Thus, students' engagement by utilizing social media fosters collaborative learning, which leads to better academic performance. (Al-Rahmi et al., 2017).

The perceived usefulness \rightarrow attitude with a p-value of 0.000, supports Hypothesis 2: There is a positive correlation between perceived usefulness and the attitude towards social media for collaborative learning with $p < 0.05$. This shows that the students' attitudes towards social media usage greatly influence the social media perception of usefulness in their collaborative learning. Therefore, the connection found is significant in the collaborative learning of college students. As for the similarities, the attitude of using social media for collaborative learning was highly determined by perceived usefulness (Al-rahmi et al., 2015).

The perceived ease of use \rightarrow attitude, with a p-value of 0.000, supports Hypothesis 3: A positive link exists between perceived ease of use and attitude toward using social media for collaborative learning with $p < 0.05$. This illustrates that the students' perceived ease of use of social media is affected by their attitude. With a significant result, thus, this perceived ease of use influences the attitude, which increases the social media usage of college students for collaborative learning. Results show that perceived ease of use greatly affects individuals' attitudes toward using social platforms. Those who believe that social media is easy to utilize and see it as beneficial are more likely to use e-

learning technology for learning (Elkaseh et al., 2016).

The social norms \rightarrow perceived ease of use, with a p-value of 0.000, supports Hypothesis 4: Perceived ease of use may influence social norms towards using social media for collaborative learning with $p < 0.05$. This indicates that perceived ease of use of social media has a relevant positive impact on the social norms that greatly affect the social media usage for collaborative learning of college students. With a significant result, thus, this perceived ease of use influences social norms, which increases the social media usage of college students for collaborative learning. According to Revythi and Tselios (2019), social norms can affect how students adopt technology and mold their behavior in relation to it. Since everyone is encouraged to use educational technologies such as social media in education, social influences significantly impact students. As a result, students motivate one another to utilize educational technologies, perhaps because they influence one another or believe this technique will benefit them in their future profession.

The social norm \rightarrow attitude with a p-value of 0.000 supports Hypothesis 5: Social norms may influence attitude towards using social media for collaborative learning where $p < 0.05$. This illustrates that the students' attitude towards social media usage for collaborative learning is affected by their social norms. Therefore, the connection found is significant in the collaborative learning of college students. This is significant for a number of reasons. For starters, it boosts morale. Comprehension of the techniques that social norms influence attitudes and; estimates contribute to the resolution of a long-standing problem in the empirical literature on media influence (Arias, 2016).

The attitude \rightarrow perceived behavioral control with a p-value of 0.000 supports Hypothesis 6: There is a positive link between attitude and

perceived behavioral control in using social media for collaborative learning where $p < 0.05$. It displays that the attitude of college students greatly influences the extent of perceived behavioral control towards social media usage for collaborative learning. Therefore, found significant and valid. Behavioral control and attitude are the factors that encourage students to use electronic-based learning for collaborative learning continuously. In addition, social interaction with peers has a significant impact and positively influences the learner's performance (Shiue & Liang, 2017).

The perceived behavioral control \rightarrow social media usage for collaborative learning with a p-value of 0.000, supports Hypothesis 7: The usage of social media for collaborative learning may be influenced by perceived behavioral control with $p < 0.05$. This implies that the perceived behavioral control of the college students has a relevant positive impact on the collaborative learning aided with social media, therefore, found significant and valid. Social media usage for collaborative learning indicates a significant positive correlation with online knowledge sharing behavior, implying that the more intensively students utilize social media for collaborative learning, the more knowledge dissemination between peers and colleagues. There is also a positive and statistically significant relationship between online knowledge sharing behavior and students' engagement. Consequently, student engagement has a significant positive relationship with student academic performance, indicating that the more engaged students in collaborative learning through the use of social media lead to student academic success (Ansari & Khan, 2020).

The social norms \rightarrow perceived behavioral control with a p-value of 0.000, supports Hypothesis 8: Social norms may influence perceived behavioral control towards using social media for collaborative learning where $p < 0.05$. This

illustrates that the students' social norms towards the use of social media as a collaborative tool have a great influence on their perceived behavioral control. The results of a partial least square analysis were showed that students' intentions to adopt m-learning were significantly influenced by the dimensions of social norm and perceived behavioral control. In the case of male students, there is a link between attitude and behavioral intention (Yeap et al. 2016).

Figure 5 is shown below to fully display the relationship of the said factors affecting students' level of engagement in using social media for collaborative learning.

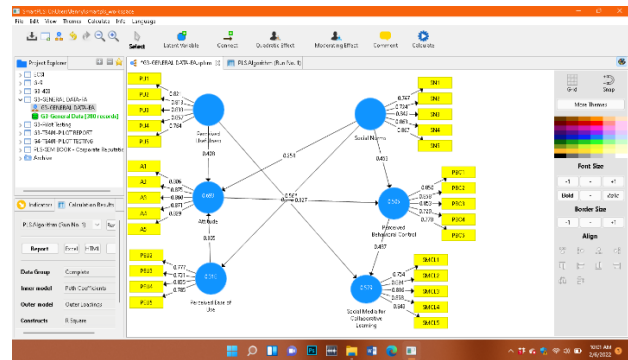


Figure 5. Social Media Usage for Collaborative Learning Algorithm Model

Figure 5 illustrates the factors affecting the students' level of engagement in using social media for collaborative learning among college students in Pampanga. The r-square exhibited 0.693 for attitude, 0.579 for social media for collaborative learning, 0.505 for perceived behavioral control, and 0.318 for perceived ease of use that uphold the variance described in the said analysis, where the SmartPLS algorithm was adopted. At the same time, the bootstrapped model of the said factors affecting students' level of engagement in using social media for collaborative learning is displayed in Figure 6.

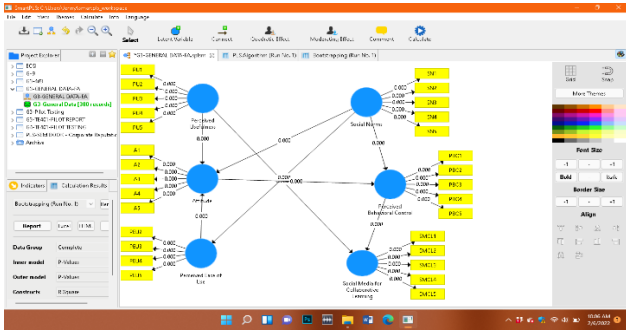


Figure 6. Social Media Usage for Collaborative Learning Bootstrapping Model

Figure 6 shows the p-values on the inner arrows and t-values on the outer arrows of the factors affecting the level of engagement in using social media for collaborative learning among college students in Pampanga. Based on the analysis, the level of engagement of the college students towards social media are positively influenced by the perceived usefulness of social media, the relationship of perceived usefulness and attitude, the effect of attitude on the perceived behavioral control towards social media, the effect of social norms to perceived ease of use of social media, the effect of social norms towards the students' perceived behavioral control in using social media for collaborative learning, the effect of social norms to attitude and the relationship of perceived usefulness and attitude

Conclusion

The study results concluded that the factors such as perceived ease of use, perceived usefulness, attitude, social norms, and perceived behavioral control greatly influence college students' level of engagement in using social media for collaborative learning. The analysis showed that the effect of perceived ease of use on social norms has the most significant influence on the level of engagement of college students in using social media for collaborative learning. Followed by the correlation of perceived usefulness and attitude, the influence of perceived behavioral control on social media, the influence of social norms on perceived behavioral control, the influence of social norms to perceived usefulness to social

media, the influence of social norms to attitude, the link between attitude and perceived behavioral control, and the link between perceived ease of use and attitude, that greatly impacts the level of engagement of students in using social media. Thus, the said factors that influenced students' engagement levels are valid and significant. Furthermore, educating college students regarding the proper usage of social media in collaborative learning will greatly improve their academic performance. The effectiveness of social media in education would improve interactive skills and information awareness in relation to collaborative learning.

Recommendation to Teachers

Teachers should continually integrate social media into their teaching strategy, especially in collaborative learning. The teachers could strive to keep the students feeling good about their collaborative learning as students are more willing to use a particular social platform if they feel good about it. The teachers can add guidelines for students whenever they use social media for collaborative learning. Lastly, the teachers may consider continuously implementing collaborative learning to students through social media. With this, collaborative learning and the academic performance of students would improve.

Recommendation to Students

Students should continue working on collaborative projects through social media. They may conduct open chats at any place if they have a Wi-Fi connection, from Facebook groups to messenger group chats and other social platforms applicable to their collaborative learning. Students can easily share knowledge and collaborate on projects at the same time, tapping on resources from all around the world. Students should value collaborative learning as a key component of their research and other academic endeavors. They can review the work of others and unify co-authored contributions through social media. The use of social media

stimulates spontaneous collaborative learning, which is important for postgraduate students since it is critical to achieving their academic goals and is highly beneficial in performing scholarly research. Lastly, students should practice the relevant skills necessary in using social media as a collaborative tool and apply them to improve their collaborative learning and academic performance.

Recommendation to the Institution

It is recommended that institutions should support regular training courses in digital skills development through workshops, seminars, and conferences to introduce postgraduate students to social media and its usefulness in research. It is recommended to encourage students and lecturers to use social media platforms such as Facebook, Messenger, and other platforms since university learning resources are easily accessible online. Students and lecturers should use social media's social aspect to improve cooperation, engagement, and communication in the learning process. However, it is critical to examine how students and researchers utilize this technology and how the social dimension of social media might help them do better in school. Highly significant would be to demonstrate to instructors the power of social media to improve the learning experience and boost academic output.

Recommendations to Researchers

In this study, some of the TPB and TAM factors were adopted and found to significantly impact the level of engagement in using social media for collaborative learning. Future researchers should also take into consideration other theories and factors that may have a significant effect on the social media engagement of students in relation to their learning. Future researchers should also consider replicating the study or establishing another research method, such as the longitudinal method, to better understand the study's development. Future researchers should also consider stratified sampling to obtain a sample

population quickly. With the response rate, the study provided significant findings with the utilization of SmartPLS 3, which may be used to analyze the factors that may affect students' engagement in social media.

References

- Aasa, Olaoluwa. (2016). Analyses and methods for Likert scale data. 10.13140/RG.2.2.32784.02569.
10.13140/RG.2.2.32784.02569
- Alarcón, D., Sánchez, J. A., & De Olavide, U. (2015, October). Assessing convergent and discriminant validity in the ADHD-R IV rating scale: User-written commands for Average Variance Extracted (AVE), Composite Reliability (CR), and Heterotrait-Monotrait ratio of correlations (HTMT). In Spanish STATA meeting (Vol. 39). Universidad Pablo de Olavide.
https://www.academia.edu/download/50804454/convergent_validity_with_average_variance_extracted.pdf
- Al-Rahmi, W., Othman, M. S., & Yusuf, L. M. (2015). The Role of Social Media for Collaborative Learning to Improve Academic Performance of Students and Researchers in Malaysian Higher Education. *International Review of Research in Open and Distance Learning*, 16(4), 177–204.
<https://doi.org/10.19173/irrodl.v16i4.2326>
- Al-Rahmi, W. M., & Zeki, A. M. (2017). A model of using social media for collaborative learning to enhance learners' performance on learning. *Journal of King Saud University-Computer and Information Sciences*, 29(4), 526–535.
<https://doi.org/10.1016/j.jksuci.2016.09.002>
- Ansari, J. A. N., & Khan, N. A. (2020). Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learning*

Environments, 7(1), 1-16.
<https://doi.org/10.1186/s40561-020-00118-7>

Arias, E. (2016). How does media influence social norms? a field experiment on the role of common knowledge.
<https://as.nyu.edu/content/dam/nyu-as/politics/documents/AriasCommonKnowledge.pdf>

Bujang, M. A., Omar, E. D., & Baharum, N. A. (2018). A review on sample size determination for Cronbach's alpha test: a simple guide for researchers. *The Malaysian journal of medical sciences: MJMS*, 25(6), 85.
 10.21315/mjms2018.25.6.9

Calma, R. R. & Oluyinka, S.A. (2020). Awareness and implementation of corporate social responsibility among lumber business in Central Luzon, Philippines. *Harvest*, 16(1).
<http://ejournals.ph/form/cite.php?id=15717>

Dijkstra, T. K., & Henseler, J. (2015). Consistent partial least squares path modeling. *MIS quarterly*, 39(2), 297-316.
<https://www.jstor.org/stable/26628355>

Elhai, J. D., Yang, H., McKay, D., & Asmundson, G. J. (2020). COVID-19 anxiety symptoms associated with problematic smartphone use severity in Chinese adults. *Journal of Affective Disorders*, 274, 576-582. <https://doi.org/10.1016/j.jad.2020.05.080>

Elkaseh, A. M., Wong, K. W., & Fung, C. C. (2016). Perceived ease of use and perceived usefulness of social media for e-learning in Libyan higher education: A structural equation modeling analysis. *International Journal of Information and Education Technology*, 6(3), 192. DOI:
<https://doi.org/10.7763/IJiet.2016.V6.683>

Hayes, A. F., & Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating

reliability. *But... Communication Methods and Measures*, 14(1), 1-24.
<https://doi.org/10.1080/19312458.2020.1718629>

Huang, C. (2017). Time spent on social network sites and psychological well-being: a meta-analysis. *Cyberpsychol. Behav. Soc. Netw.* 20, 346-354.
<https://doi.org/10.1089/cyber.2016.0758>

In, J. (2017). Introduction of a pilot study. *Korean journal of anesthesiology*, 70(6), 601. 10.4097/kjae.2017.70.6.601

Karadkar, A. (2015). The impact of social media on student life. *Technician*, Sep, 13, 2015. http://www.technicianonline.com/opinion/article_d112b70-5a92-11e5-86b4-cb7c98a6e45f.html

Lubua, E. W., Semlambo, A., & Pretorius, P. D. (2017). Factors affecting the use of social media in the learning process. *South African Journal of Information Management*, 19(1), 1-7.
<https://doi.org/10.4102/sajim.v19i1.764>

McCusker, K., & Gunaydin, S. (2015). Research using qualitative, quantitative or mixed methods and choice based on the research. *Perfusion*, 30(7), 537-542.
<https://doi.org/10.1177/0267659114559116>

Masrek, M. N., and Zainol, N. Z. M. (2015). The relationship between knowledge conversion abilities and academic performance. *Proc. Soc. Behav. Sci.* 174, 3603-3610.
<https://doi.org/10.1016/j.sbspro.2015.01.1078>

Pangilinan, R. R., Yutuc, M. M. T., Nuqui, J. C., Garnica, L. L., & Ayodele, S. (2020). Study on Copyright Awareness among College Students. *International Journal of Knowledge Engineering*, 6(1), 35-39.
<https://doi.org/10.18178/ijke.2020.6.1.129>

Raosoft, I. (2020). Sample size calculator by Raosoft, Inc. <http://www.raosoft.com/samplesize.html>

Revythi, A., & Tselios, N. (2019). Extension of technology acceptance model by using system usability scale to assess behavioral intention to use e-learning. *Education and Information technologies*, 24(4), 2341-2355. <https://doi.org/10.1007/s10639-019-09869-4>

Rigdon, E. E., Sarstedt, M., & Ringle, C. M. (2017). On comparing results from CB-SEM and PLS-SEM: Five perspectives and five recommendations. *Marketing: ZFP—Journal of Research and Management*, 39(3), 4-16. <https://www.jstor.org/stable/26426850>.

Roman, R. G., Trobada, C. S. P., Gatón, F. P., Gania, C. K., Oluyinka, S. A., Cuenco, H. O., & Daenos, R. G. (2020). A Study on the Utilization of e-Resources among College Students. *International Journal of Knowledge Engineering*, 6(1). <https://doi.org/10.18178/ijke.2020.6.1.127>

Sarstedt, M., & Cheah, J. H. (2019). Partial least squares structural equation modeling using SmartPLS: a software review. <https://doi.org/10.1057/s41270-019-00058-3>

Shiue, Y. M., Hsu, Y. C., & Liang, Y. C. (2017, May). Modeling the continuance usage intention of game-based learning in the context of collaborative learning. In 2017 International Conference on Applied System Innovation (ICASI) (pp. 1106-1109). IEEE 10.1109/ICASI.2017.7988196

Souza, A. C. D., Alexandre, N. M. C., & Guirardello, E. D. B. (2017). Psychometric properties in instruments evaluation of reliability and validity. *Epidemiologia e Serviços de Saúde*, 26, 649-659. 10.5123/S1679-49742017000300022

Stratton, S. J. (2021). Population Research: Convenience Sampling Strategies. *Prehospital and disaster Medicine*, 36(4), 373-374. <https://doi.org/10.1017/S1049023X21000649>

Taheri, B., Porter, C., Valantasis-Kanellos, N., & König, C. (2015). Quantitative data gathering techniques. *Research methods for business and management: A guide to writing your dissertation*, 155-174. 10.13140/RG.2.2.21470.43843

Twenge, J. M., Martin, G. N., and Campbell, W. K. (2018). Decreases in psychological well-being among American adolescents after 2012 and links to screen time during the rise of smartphone technology. *Emotion* 18, 765–780. <https://doi.org/10.1037/emo0000403>

Yeap, J. A., Ramayah, T., & Soto-Acosta, P. (2016). Factors propelling the adoption of m- <https://doi.org/10.1007/s12525-015-0214-x>